

CLAIMS

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65. (Amended) A physical vapor deposition target consisting essentially of an alloy of copper and silver, the silver being present in the alloy at from less than 1.0 at% to 0.001 at%, the alloy having a substantially uniform microstructure and a fine grain size.

66. The physical vapor deposition target of claim 65 wherein the grain size is less than or equal to about 20 micrometers.

67. The physical vapor deposition target of claim 66 wherein the grain size is about 20 micrometers.

68. (Amended) A physical vapor deposition target consisting essentially of an alloy of copper and silver, the silver being uniformly distributed fine precipitates in the alloy microstructure and being present in the alloy at from less than 1.0 at% to 0.001 at%.

69. The physical vapor deposition target of claim 68 wherein the alloy has a resistivity of from about 1.7 microohms.cm to about 1.82 microohms.cm.

70. The physical vapor deposition target of claim 68 wherein the grain size is less than or equal to about 20 micrometers.

71. (Amended) A physical vapor deposition target consisting essentially of an alloy of copper and silver and having a grain size of less than or equal to about 20 micrometers, the silver being present in the alloy at from less than 1.0 at% to 0.001 at%.

72. The physical vapor deposition target of claim 71 wherein the grain size is about 20 micrometers.

73. (Amended) A physical vapor deposition target consisting essentially of an alloy of copper and silver, the silver being present in the alloy at from 50 at% to 70 at%, the target having a substantially uniform microstructure and a fine grain size.

74. (Amended) A physical vapor deposition target consisting essentially of copper, from less than 1.0 at% to 0.001 at% Sn, and optionally silver, the target having an average grain size of less than or equal to about 30 micrometers.

75. (Amended) The physical vapor deposition target of claim 74 comprising silver.

76. The physical vapor deposition target of claim 75 wherein the silver is present at from less than 1.0 at% to 0.001 at%.

77. The physical vapor deposition target of claim 75 wherein the average grain size is less than or equal to about 20 micrometers.

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78. (Cancelled)

79. (Cancelled)

80. (Cancelled)

81. (Amended) A physical vapor deposition target consisting essentially of a copper material having at least one element selected from the group consisting of silver and tin, having an average grain size of less than about 30 micrometers, having an electrical resistivity of from about 1.7 microohms/cm to about 1.82 microohms/cm, and having an electromigration resistance higher than copper of the same grain size having a purity of greater than 99.999%.

82. The physical vapor deposition target of claim 81 wherein the resistivity is less than about 1.8 microhm.cm.

84. The physical vapor deposition target of claim 81 wherein the at least one element is tin, the tin being present in the copper material at from less than 1.0 at% to 0.001 at%.

85. The physical vapor deposition target of claim 81 wherein the at least one element is silver, the silver being present in the copper material at from less than 1.0 at% to 0.001 at%.

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86. (Cancelled)

87. (Cancelled)

88. (Amended) A physical vapor deposition target consisting essentially of a copper alloy, the copper alloy containing copper of 99.9998% purity alloyed with a total concentration of other elements of from less than 1.0 at% to 0.001 at%, the other elements being selected from the group consisting of Ag, Sn, Be, Ca, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ti, Zr, Hf, Zn, Cd, B, Ga, In, C, Te, V, Nb, Ta, Cr, W, Mn, Fe, Ru, Os, Co, Rh, Ni, Pd, Pt, Au, and Pb, the copper alloy comprising a substantially uniform microstructure and a fine grain size.

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